Sequence Listing

<110> Hofmann, Kay

<120> Protease

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<140> US 09/869,309
<141> 2001-07-20

<150> 19902550.9
<151> 1999-01-22

<150> 19925946.1
<151> 1999-06-08

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<151> 1999-06-24

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<170> PatentIn Ver. 2.1

<210> 1
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<212> PRT
<213> Homo sapiens

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Leu Leu Leu Ala Ala Gln Val Ala Cys Glu Tyr Gly Met Val His Val
20 25 30

Val Ser Gln Ala Gly Gly Pro Glu Gly Lys Asp Tyr Cys Ile Leu Tyr
35 40 45

Asn Pro Gln Trp Ala His Leu Pro His Asp Leu Ser Lys Ala Ser Phe
50 55 60

Leu Gln Leu Arg Asn Trp Thr Ala Ser Leu Leu Cys Ser Ala Ala Asp
65 70 75 80

Leu Pro Ala Arg Gly Phe Ser Asn Gln Ile Pro Leu Val Ala Arg Gly
85 90 95

Asn Cys Thr Phe Tyr Glu Lys Val Arg Leu Ala Gln Gly Ser Gly Ala
100 105 110

Arg Gly Leu Leu Ile Val Ser Arg Glu Arg Leu Val Pro Pro Gly Gly
115 120 125

Asn Lys Thr Gln Tyr Asp Glu Ile Gly Ile Pro Val Ala Leu Leu Ser
130 135 140

Tyr Lys Asp Met Leu Asp Ile Phe Thr Arg Phe Gly Arg Thr Val Arg
145 150 155 160

Ala Ala Leu Tyr Ala Pro Lys Glu Pro Val Leu Asp Tyr Asn Met Val
165 170 175

Ile Ile Phe Ile Met Ala Val Gly Thr Val Ala Ile Gly Gly Tyr Trp
180 185 190

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Ala Gly Ser Arg Asp Val Lys Lys Arg Tyr Met Lys His Lys Arg Asp
        195                 200                 205

Asp Gly Pro Glu Lys Gln Glu Asp Glu Ala Val Asp Val Thr Pro Val
    210                 215                 220

Met Thr Cys Val Phe Val Val Met Cys Cys Ser Met Leu Val Leu Leu
225                 230                 235                 240

Tyr Tyr Phe Tyr Asp Leu Leu Val Tyr Val Val Ile Gly Ile Phe Cys
                245                 250                 255

Leu Ala Ser Ala Thr Gly Leu Tyr Ser Cys Leu Ala Pro Cys Val Arg
            260                 265                 270

Arg Leu Pro Phe Gly Lys Cys Arg Ile Pro Asn Asn Ser Leu Pro Tyr
        275                 280                 285

Phe His Lys Arg Pro Gln Ala Arg Met Leu Leu Leu Ala Leu Phe Cys
    290                 295                 300

Val Ala Val Ser Val Val Trp Gly Val Phe Arg Asn Glu Asp Gln Trp
305                 310                 315                 320

Ala Trp Val Leu Gln Asp Ala Leu Gly Ile Ala Phe Cys Leu Tyr Met
                325                 330                 335

Leu Lys Thr Ile Arg Leu Pro Thr Phe Lys Ala Cys Thr Leu Leu Leu
            340                 345                 350

Leu Val Leu Phe Leu Tyr Asp Ile Phe Phe Val Phe Ile Thr Pro Phe
        355                 360                 365

Leu Thr Lys Ser Gly Ser Ser Ile Met Val Glu Val Ala Thr Gly Pro
    370                 375                 380

Ser Asp Ser Ala Thr Arg Glu Lys Leu Pro Met Val Leu Lys Val Pro
385                 390                 395                 400

Arg Leu Asn Ser Ser Pro Leu Ala Leu Cys Asp Arg Pro Phe Ser Leu
                405                 410                 415

Leu Gly Phe Gly Asp Ile Leu Val Pro Gly Leu Leu Val Ala Tyr Cys
            420                 425                 430

His Arg Phe Asp Ile Gln Val Gln Ser Ser Arg Val Tyr Phe Val Ala
        435                 440                 445

Cys Thr Ile Ala Tyr Gly Val Gly Leu Leu Val Thr Phe Val Ala Leu
    450                 455                 460

Ala Leu Met Gln Arg Gly Gln Pro Ala Leu Leu Tyr Leu Val Pro Cys
465                 470                 475                 480

Thr Leu Val Thr Ser Cys Ala Val Ala Leu Trp Arg Arg Glu Leu Gly
                485                 490                 495

Val Phe Trp Thr Gly Ser Gly Phe Ala Lys Val Leu Pro Pro Ser Pro
            500                 505                 510

Trp Ala Pro Ala Pro Ala Asp Gly Pro Gln Pro Pro Lys Asp Ser Ala
        515                 520                 525

Thr Pro Leu Ser Pro Gln Pro Pro Ser Glu Glu Pro Ala Thr Ser Pro
    530                 535                 540
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```
Trp Pro Ala Glu Gln Ser Pro Lys Ser Arg Thr Ser Glu Glu Met Gly
545                 550                 555                 560

Ala Gly Ala Pro Met Arg Glu Pro Gly Ser Pro Ala Glu Ser Glu Gly
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Arg Asp Gln Ala Gln Pro Ser Pro Val Thr Gln Pro Gly Ala Ser Ala
            580                 585                 590
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<210> 2
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<212> PRT
<213> Homo sapiens

<400> 2

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Gly Phe Leu Leu Gln Leu Thr Ala Ala Gln Glu Ala Ile Leu His Ala
             20                  25                  30

Ser Gly Asn Gly Thr Thr Lys Asp Tyr Cys Met Leu Tyr Asn Pro Tyr
         35                  40                  45

Trp Thr Ala Leu Pro Ser Thr Leu Glu Asn Ala Thr Ser Ile Ser Leu
     50                  55                  60

Met Asn Leu Thr Ser Thr Pro Leu Cys Asn Leu Ser Asp Ile Pro Pro
 65                  70                  75                  80

Val Gly Ile Lys Ser Lys Ala Val Val Val Pro Trp Gly Ser Cys His
                 85                  90                  95

Phe Leu Glu Lys Ala Arg Ile Ala Gln Lys Gly Gly Ala Glu Ala Met
            100                 105                 110

Leu Val Val Asn Asn Ser Val Leu Phe Pro Pro Ser Gly Asn Arg Ser
        115                 120                 125

Glu Phe Pro Asp Val Lys Ile Leu Ile Ala Phe Ile Ser Tyr Lys Asp
    130                 135                 140

Phe Arg Asp Met Asn Gln Thr Leu Gly Asp Asn Ile Thr Val Lys Met
145                 150                 155                 160

Tyr Ser Pro Ser Trp Pro Asn Phe Asp Tyr Thr Met Val Val Ile Phe
                165                 170                 175

Val Ile Ala Val Phe Thr Val Ala Leu Gly Gly Tyr Trp Ser Gly Leu
            180                 185                 190

Val Glu Leu Glu Asn Leu Lys Ala Val Thr Thr Glu Asp Arg Glu Met
        195                 200                 205

Arg Lys Lys Lys Glu Glu Tyr Leu Thr Phe Ser Pro Leu Thr Val Val
    210                 215                 220

Ile Phe Val Val Ile Cys Cys Val Met Met Val Leu Leu Tyr Phe Phe
225                 230                 235                 240

Tyr Lys Trp Leu Val Tyr Val Met Ile Ala Ile Phe Cys Ile Ala Ser
```

```
                245                 250                 255

Ala Met Ser Leu Tyr Asn Cys Leu Ala Ala Leu Ile His Lys Ile Pro
            260                 265                 270

Tyr Gly Gln Cys Thr Ile Ala Cys Arg Gly Lys Asn Met Glu Val Arg
        275                 280                 285

Leu Ile Phe Leu Ser Gly Leu Cys Ile Ala Val Ala Val Val Trp Ala
    290                 295                 300

Val Phe Arg Asn Glu Asp Arg Trp Ala Trp Ile Leu Gln Asp Ile Leu
305                 310                 315                 320

Gly Ile Ala Phe Cys Leu Asn Leu Ile Lys Thr Leu Lys Leu Pro Asn
                325                 330                 335

Phe Lys Ser Cys Val Ile Leu Leu Gly Leu Leu Leu Leu Tyr Asp Val
            340                 345                 350

Phe Phe Val Phe Ile Thr Pro Phe Ile Thr Lys Asn Gly Glu Ser Ile
        355                 360                 365

Met Val Glu Leu Ala Ala Gly Pro Phe Gly Asn Asn Glu Lys Leu Pro
    370                 375                 380

Val Val Ile Arg Val Pro Lys Leu Ile Tyr Phe Ser Val Met Ser Val
385                 390                 395                 400

Cys Leu Met Pro Val Ser Ile Leu Gly Phe Gly Asp Ile Ile Val Pro
                405                 410                 415

Gly Leu Leu Ile Ala Tyr Cys Arg Arg Phe Asp Val Gln Thr Gly Ser
            420                 425                 430

Ser Tyr Ile Tyr Tyr Val Ser Ser Thr Val Ala Tyr Ala Ile Gly Met
        435                 440                 445

Ile Leu Thr Phe Val Val Leu Val Leu Met Lys Lys Gly Gln Pro Ala
    450                 455                 460

Leu Leu Tyr Leu Val Pro Cys Thr Leu Ile Thr Ala Ser Val Val Ala
465                 470                 475                 480

Trp Arg Arg Lys Glu Met Lys Lys Phe Trp Lys Gly Asn Ser Tyr Gln
                485                 490                 495

Met Met Asp His Leu Asp Cys Ala Thr Asn Glu Glu Asn Pro Val Ile
            500                 505                 510

Ser Gly Glu Gln Ile Val Gln Gln
        515                 520
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<210> 3
<211> 377
<212> PRT
<213> Homo sapiens

<400> 3

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Met Asp Ser Ala Leu Ser Asp Pro His Asn Gly Ser Ala Glu Ala Gly
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Gly Pro Thr Asn Ser Thr Thr Arg Pro Pro Ser Thr Pro Glu Gly Ile
             20                  25                  30
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```
Ala Leu Ala Tyr Gly Ser Leu Leu Leu Met Ala Leu Leu Pro Ile Phe
         35                  40                  45

Phe Gly Ala Leu Arg Ser Val Arg Cys Ala Arg Gly Lys Asn Ala Ser
     50                  55                  60

Asp Met Pro Glu Thr Ile Thr Ser Arg Asp Ala Ala Arg Phe Pro Ile
 65                  70                  75                  80

Ile Ala Ser Cys Thr Leu Leu Gly Leu Tyr Leu Phe Phe Lys Ile Phe
                 85                  90                  95

Ser Gln Glu Tyr Ile Asn Leu Leu Leu Ser Met Tyr Phe Phe Val Leu
            100                 105                 110

Gly Ile Leu Ala Leu Ser His Thr Ile Ser Pro Phe Met Asn Lys Phe
        115                 120                 125

Phe Pro Ala Ser Phe Pro Asn Arg Gln Tyr Gln Leu Leu Phe Thr Gln
    130                 135                 140

Gly Ser Gly Glu Asn Lys Glu Glu Ile Ile Asn Tyr Glu Phe Asp Thr
145                 150                 155                 160

Lys Asp Leu Val Cys Leu Gly Leu Ser Ser Ile Val Gly Val Trp Tyr
                165                 170                 175

Leu Leu Arg Lys His Trp Ile Ala Asn Asn Leu Phe Gly Leu Ala Phe
            180                 185                 190

Ser Leu Asn Gly Val Glu Leu Leu His Leu Asn Asn Val Ser Thr Gly
        195                 200                 205

Cys Ile Leu Leu Gly Gly Leu Phe Ile Tyr Asp Val Phe Trp Val Phe
    210                 215                 220

Gly Thr Asn Val Met Val Thr Val Ala Lys Ser Phe Glu Ala Pro Ile
225                 230                 235                 240

Lys Leu Val Phe Pro Gln Asp Leu Leu Glu Lys Gly Leu Glu Ala Asn
                245                 250                 255

Asn Phe Ala Met Leu Gly Leu Gly Asp Val Val Ile Pro Gly Ile Phe
            260                 265                 270

Ile Ala Leu Leu Leu Arg Phe Asp Ile Ser Leu Lys Lys Asn Thr His
        275                 280                 285

Thr Tyr Phe Tyr Thr Ser Phe Ala Ala Tyr Ile Phe Gly Leu Gly Leu
    290                 295                 300

Thr Ile Phe Ile Met His Ile Phe Lys His Ala Gln Pro Ala Leu Leu
305                 310                 315                 320

Tyr Leu Val Pro Ala Cys Ile Gly Phe Pro Val Leu Val Ala Leu Ala
                325                 330                 335

Lys Gly Glu Val Thr Glu Met Phe Ser Tyr Glu Glu Ser Asn Pro Lys
            340                 345                 350

Asp Pro Ala Ala Val Thr Glu Ser Lys Glu Gly Thr Glu Ala Ser Ala
        355                 360                 365

Ser Lys Gly Leu Glu Lys Lys Glu Lys
    370                 375
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<210> 4
<211> 384
<212> PRT
<213> Homo sapiens

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Gln Val Ser Thr Phe Leu Ile Ser Ile Leu Leu Ile Val Tyr Gly Ser
20 25 30

Phe Arg Ser Leu Asn Met Asp Phe Glu Asn Gln Asp Lys Glu Lys Asp
35 40 45

Ser Asn Ser Ser Ser Gly Ser Phe Asn Gly Asn Ser Thr Asn Asn Ser
50 55 60

Ile Gln Thr Ile Asp Ser Thr Gln Ala Leu Phe Leu Pro Ile Gly Ala
65 70 75 80

Ser Val Ser Leu Leu Val Met Phe Phe Phe Phe Asp Ser Val Gln Val
85 90 95

Val Phe Thr Ile Cys Thr Ala Val Leu Ala Thr Ile Ala Phe Ala Phe
100 105 110

Leu Leu Leu Pro Met Cys Gln Tyr Leu Thr Arg Pro Cys Ser Pro Gln
115 120 125

Asn Lys Ile Ser Phe Gly Cys Cys Gly Arg Phe Thr Ala Ala Glu Leu
130 135 140

Leu Ser Phe Ser Leu Ser Val Met Leu Val Leu Ile Trp Val Leu Thr
145 150 155 160

Gly His Trp Leu Leu Met Asp Ala Leu Ala Met Gly Leu Cys Val Ala
165 170 175

Met Ile Ala Phe Val Arg Leu Pro Ser Leu Lys Val Ser Cys Leu Leu
180 185 190

Leu Ser Gly Leu Leu Ile Tyr Asp Val Phe Trp Val Phe Phe Ser Ala
195 200 205

Tyr Ile Phe Asn Ser Asn Val Met Val Lys Val Ala Thr Gln Pro Ala
210 215 220

Asp Asn Pro Leu Asp Val Leu Ser Arg Lys Leu His Leu Gly Pro Asn
225 230 235 240

Val Gly Arg Asp Val Pro Arg Leu Ser Leu Pro Gly Lys Leu Val Phe
245 250 255

Pro Ser Ser Thr Gly Ser His Phe Ser Met Leu Gly Ile Gly Asp Ile
260 265 270

Val Met Pro Gly Leu Leu Leu Cys Phe Val Leu Arg Tyr Asp Asn Tyr
275 280 285

Lys Lys Gln Ala Ser Gly Asp Ser Cys Gly Ala Pro Gly Pro Ala Asn
290 295 300

```
Ile Ser Gly Arg Met Gln Lys Val Ser Tyr Phe His Cys Thr Leu Ile
305                 310                 315                 320

Gly Tyr Phe Val Gly Leu Leu Thr Ala Thr Val Ala Ser Arg Ile His
                325                 330                 335

Arg Ala Ala Gln Pro Ala Leu Leu Tyr Leu Val Pro Phe Thr Leu Leu
            340                 345                 350

Pro Leu Leu Thr Met Ala Tyr Leu Lys Gly Asp Leu Arg Arg Met Trp
        355                 360                 365

Ser Glu Pro Phe His Ser Lys Ser Ser Ser Ser Arg Phe Leu Glu Val
    370                 375                 380
```

<210> 5
<211> 113
<212> PRT
<213> Mus musculus

<400> 5

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Val Leu Gly Phe Gly Asp Ile Ile Val Pro Gly Leu Leu Ile Ala Tyr
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Cys Arg Arg Phe Asp Val Gln Thr Gly Ser Ser Ile Tyr Tyr Ile Ser
             20                  25                  30

Ser Thr Ile Ala Tyr Ala Val Gly Met Ile Ile Thr Phe Val Val Leu
         35                  40                  45

Met Val Met Lys Thr Gly Gln Pro Ala Leu Leu Tyr Leu Val Pro Cys
     50                  55                  60

Thr Leu Ile Thr Val Ser Val Val Ala Trp Ser Arg Lys Glu Met Lys
 65                  70                  75                  80

Lys Phe Trp Lys Gly Ser Ser Tyr Gln Val Met Asp His Leu Asp Tyr
                85                  90                  95

Ser Thr Asn Glu Glu Asn Pro Val Thr Thr Asp Glu Gln Ile Val Gln
            100                 105                 110

Gln
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<210> 6
<211> 378
<212> PRT
<213> Mus musculus

<400> 6

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Met Asp Ser Ala Val Ser Asp Pro His Asn Gly Ser Ala Glu Ala Gly
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Thr Pro Ala Asn Gly Thr Thr Arg Pro Pro Ser Thr Pro Glu Gly Ile
             20                  25                  30

Ala Leu Ala Tyr Gly Ser Leu Leu Leu Met Ala Leu Leu Pro Ile Phe
         35                  40                  45
```

```
Phe Gly Ala Leu Pro Ser Val Arg Cys Ala Arg Gly Lys Ser Ser Ser
     50                  55                  60

Asp Met Pro Glu Thr Ile Thr Ser Arg Asp Ala Ala Arg Phe Pro Ile
 65                  70                  75                  80

Ile Ala Ser Cys Thr Leu Leu Gly Leu Tyr Leu Phe Phe Lys Ile Phe
                 85                  90                  95

Ser Gln Glu Tyr Ile Asn Leu Leu Leu Ser Met Tyr Phe Phe Val Leu
            100                 105                 110

Gly Ile Leu Ala Leu Ser His Thr Ile Ser Pro Phe Met Asn Lys Phe
        115                 120                 125

Phe Pro Ala Asn Phe Pro Asn Arg Gln Tyr Gln Leu Leu Phe Thr Gln
    130                 135                 140

Gly Ser Gly Glu Asn Lys Glu Glu Ile Ile Asn Tyr Glu Phe Asp Thr
145                 150                 155                 160

Lys Asp Leu Val Cys Leu Gly Leu Ser Ser Val Val Gly Val Trp Tyr
                165                 170                 175

Leu Leu Arg Lys His Trp Ile Ala Asn Asn Leu Phe Gly Leu Ala Phe
            180                 185                 190

Ser Leu Asn Gly Val Glu Leu Leu His Leu Asn Asn Val Ser Thr Gly
        195                 200                 205

Cys Ile Leu Leu Gly Gly Leu Phe Ile Tyr Asp Ile Phe Trp Val Phe
    210                 215                 220

Gly Thr Asn Val Met Val Thr Val Ala Lys Ser Phe Glu Ala Pro Ile
225                 230                 235                 240

Lys Leu Val Phe Pro Gln Asp Leu Leu Glu Lys Gly Leu Glu Ala Asp
                245                 250                 255

Asn Phe Ala Met Leu Gly Leu Gly Asp Ile Val Ile Pro Gly Ile Phe
            260                 265                 270

Ile Ala Leu Leu Leu Arg Phe Asp Ile Ser Leu Lys Lys Asn Thr His
        275                 280                 285

Thr Tyr Phe Tyr Thr Ser Phe Ala Ala Tyr Ile Phe Gly Leu Gly Leu
    290                 295                 300

Thr Ile Phe Ile Met His Ile Phe Lys His Ala Gln Pro Ala Leu Leu
305                 310                 315                 320

Tyr Leu Val Pro Ala Cys Ile Gly Phe Pro Val Leu Val Ala Leu Ala
                325                 330                 335

Lys Gly Glu Val Ala Glu Met Phe Ser Tyr Glu Glu Ser Asn Pro Lys
            340                 345                 350

Asp Pro Ala Ala Val Thr Glu Ser Lys Glu Glu Ser Thr Glu Ala Ser
        355                 360                 365

Ala Ser Lys Arg Leu Glu Lys Lys Glu Lys
    370                 375
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<213> Mus musculus

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Leu Leu Ser Phe Tyr Leu Ser Val Met Leu Val Leu Ile Trp Val Leu
20 25 30

Thr Gly His Trp Leu Leu Met Asp Ala Leu Ala Met Gly Leu Cys Val
35 40 45

Ala Met Ile Ala Phe Val Arg Leu Pro Ser Leu Lys Val Ser Cys Leu
50 55 60

Leu Leu Ser Gly Leu Leu Ile Tyr Asp Val Phe Trp Val Phe Phe Ser
65 70 75 80

Ala Tyr Ile Phe Asn Ser Asn Val Met Val Lys Val Ala Thr Gln Pro
85 90 95

Ala Asp Asn Pro Leu Asp Val Leu Ser Arg Lys Leu His Leu Gly Pro
100 105 110

Asn Val Gly Arg Asp Val Pro Arg Leu Ser Leu Pro Gly Lys Leu Val
115 120 125

Phe Pro Ser Ser Thr Gly Ser His Phe Ser Met Leu Gly Ile Gly Asp
130 135 140

Ile Val Met Pro Gly Leu Leu Leu Cys Phe Val Leu Arg Tyr Asp Asn
145 150 155 160

Tyr Lys Lys Gln Ala Ser Gly Asp Ser Cys Gly Ala Pro Gly Xaa Ala
165 170 175

Asn Ile Ser Gly Arg Met Gln Lys Val Ser Tyr Phe His Cys Thr Leu
180 185 190

Ile Gly Tyr Phe Val Gly Leu Leu Thr Ala Thr Val Ala Ser Arg Val
195 200 205

His Arg Ala Ala Gln Pro Ala Leu Leu Tyr Leu Val Pro Phe Thr Leu
210 215 220

Leu Pro Leu Leu Thr Met Ala Tyr Leu Lys Gly Asp Leu Arg Arg Met
225 230 235 240

Trp Ser Glu Pro Phe His Ser Lys Ser Ser Ser Ser Arg Phe Leu Glu
245 250 255

Val

<210> 8

<211> 587
<212> PRT
<213> Saccharomyces cerevisiae

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Met Asp Lys Tyr Leu Asn Ser Phe Val Asp His Leu Ser Glu Trp Ser
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Ser Arg Ala Phe Arg Asn Asn Ser Ser Ser Ala Asn Gln Ser Ala Ser
20 25 30

Asn Lys Glu Leu Glu Gln Val Phe Glu Gln Ile Asn Ala Ile Val Glu
35 40 45

Asn His Asn Asn Lys Leu Thr Thr Ala Phe Asp Lys Ile Ser Tyr Arg
50 55 60

Val Ala His Lys Ile Thr His Leu Val Glu Ser His Ser Leu Val Phe
65 70 75 80

Asn Tyr Ala Thr Leu Val Leu Ile Ala Ser Ala Leu Val Val Ile Gly
85 90 95

Ser Phe Thr Ser Ile Ser Ser Ile Pro Phe Thr Ala Leu Pro Pro Thr
100 105 110

Arg Glu His Ser Leu Phe Asp Pro Thr Asp Phe Asp Val Asp His Asp
115 120 125

Cys His Val Ile Tyr Arg Glu Asn Asp Glu Asp Lys Lys Lys Lys Lys
130 135 140

Lys Ser Lys Arg Phe Phe Asp Met Met Asp Glu Lys His Ala Ile Ile
145 150 155 160

Leu Pro Leu Thr Ser Gly Cys Thr Leu Leu Ala Leu Tyr Phe Val Ile
165 170 175

Lys Lys Leu His Leu Asn Trp Leu Lys Tyr Val Val Lys Ile Leu Asn
180 185 190

Phe Asn Ile Thr Leu Leu Asn Ile Pro Ala Gly Thr Phe Val Tyr Ser
195 200 205

Tyr Phe Leu Asn Ser Leu Phe Arg Asn Leu Ser His Leu Ala Ser Trp
210 215 220

Asn Pro Leu Val Val Leu Pro Arg Tyr Arg Val Thr Ile Ala Asp Asp
225 230 235 240

Asn Glu Asp Leu Asn Lys Ile Gly Gly Phe Val Thr Asn Leu Asn Tyr
245 250 255

Lys Asp Gly Leu Thr Asn Ser Val Val His Lys Lys Thr Leu Asp Glu
260 265 270

Ile Glu Lys Asp His Trp Met Lys His Phe Tyr Arg Arg Glu Leu Val
275 280 285

Glu Pro Lys Asp Ile Lys Ser Lys Arg Gln Ile Ser Asn Met Tyr Leu
290 295 300

Asn Ser Ala Leu Ile Val Ser Phe Val Leu Ser Ile Val Ser Thr Val
305 310 315 320

Tyr Phe Tyr Leu Ser Pro Asn Asp Trp Leu Ile Ser Asn Ala Val Ser

```
                325                 330                 335

Met Asn Met Ala Ile Trp Ser Ile Ala Gln Leu Lys Leu Lys Asn Leu
            340                 345                 350

Lys Ser Gly Ala Leu Ile Leu Ile Ala Leu Phe Phe Tyr Asp Ile Cys
        355                 360                 365

Phe Val Phe Gly Thr Asp Val Met Val Thr Val Ala Thr Asn Leu Asp
    370                 375                 380

Ile Pro Val Lys Leu Ser Leu Pro Val Lys Phe Asn Thr Ala Gln Asn
385                 390                 395                 400

Asn Phe Asn Phe Ser Ile Leu Gly Leu Gly Asp Ile Ala Leu Pro Gly
                405                 410                 415

Met Phe Ile Ala Met Cys Tyr Lys Tyr Asp Ile Trp Lys Trp His Leu
            420                 425                 430

Asp His Asp Asp Thr Glu Phe His Phe Leu Asn Trp Ser Tyr Val Gly
        435                 440                 445

Lys Tyr Phe Ile Thr Ala Met Val Ser Tyr Val Ala Ser Leu Val Ser
    450                 455                 460

Ala Met Val Ser Leu Ser Ile Phe Asn Thr Ala Gln Pro Ala Leu Leu
465                 470                 475                 480

Tyr Ile Val Pro Ser Leu Leu Ile Ser Thr Ile Leu Val Ala Cys Trp
                485                 490                 495

Asn Lys Asp Phe Lys Gln Phe Trp Asn Phe Gln Tyr Asp Thr Ile Glu
            500                 505                 510

Val Asp Lys Ser Leu Lys Lys Ala Ile Glu Lys Lys Glu Asn Ser Ile
        515                 520                 525

Thr Tyr Ser Thr Phe Ile Leu Ser Glu Tyr Tyr Asn Asp Ala Asp Lys
    530                 535                 540

Tyr Ala Leu Leu Gly Asp Asp Val Asn Glu Asn Phe Asp Asp Asp Glu
545                 550                 555                 560

Glu Phe Val Gln Glu Glu Asp Leu Ser Asp Ser Ser Glu Glu Glu Leu
                565                 570                 575

Ser Glu Glu Asp Leu Leu Asp Asp Glu Ser Ser
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<212> DNA
<213> Saccharomyces cerevisiae

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<213> Homo sapiens

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<213> Mus musculus

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<212> DNA
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<211> 1761
<212> DNA
<213> Saccharomyces cerevisiae

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<212> DNA
<213> Homo sapiens

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<211> 520
<212> PRT
<213> Homo sapiens

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Gly Phe Leu Leu Gln Leu Thr Ala Ala Gln Glu Ala Ile Leu His Ala
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Ser Gly Asn Gly Thr Thr Lys Asp Tyr Cys Met Leu Tyr Asn Pro Tyr
         35                  40                  45

Trp Thr Ala Leu Pro Ser Thr Leu Glu Asn Ala Thr Ser Ile Ser Leu
     50                  55                  60

Met Asn Leu Thr Ser Thr Pro Leu Cys Asn Leu Ser Asp Ile Pro Pro
 65                  70                  75                  80

Val Gly Ile Lys Ser Lys Ala Val Val Val Pro Trp Gly Ser Cys His
                85                  90                  95

Phe Leu Glu Lys Ala Arg Ile Ala Gln Lys Gly Gly Ala Glu Ala Met
            100                 105                 110

Leu Val Val Asn Asn Ser Val Leu Phe Pro Pro Ser Gly Asn Arg Ser
        115                 120                 125

Glu Phe Pro Asp Val Lys Ile Leu Ile Ala Phe Ile Ser Tyr Lys Asp
    130                 135                 140

Phe Arg Asp Met Asn Gln Thr Leu Gly Asp Asn Ile Thr Val Lys Met
145                 150                 155                 160

Tyr Ser Pro Ser Trp Pro Asn Tyr Asp Tyr Thr Met Val Gly Ile Phe
                165                 170                 175

Gly Ile Ala Val Phe Thr Gly Ala Leu Ser Gly Tyr Trp Ser Gly Leu
            180                 185                 190

Val Glu Leu Glu Asn Leu Lys Ala Val Thr Thr Glu Asp Arg Glu Met
        195                 200                 205

Arg Lys Lys Lys Glu Glu Tyr Leu Thr Phe Ser Pro Leu Thr Val Val
    210                 215                 220

Ile Phe Val Val Ile Cys Cys Val Met Met Val Leu Leu Tyr Phe Phe
225                 230                 235                 240

Tyr Lys Trp Leu Val Tyr Val Met Ile Ala Ile Phe Cys Ile Ala Ser
                245                 250                 255

Ala Met Ser Leu Tyr Asn Cys Leu Ala Ala Leu Ile His Lys Ile Pro
            260                 265                 270

Tyr Gly Gln Cys Thr Ile Ala Cys Arg Gly Lys Asn Met Glu Val Arg
        275                 280                 285

Leu Ile Phe Leu Ser Gly Leu Cys Ile Ala Val Ala Val Val Trp Ala
    290                 295                 300

Val Phe Arg Asn Glu Asp Arg Trp Ala Trp Ile Leu Gln Asp Ile Leu
305                 310                 315                 320

Gly Ile Ala Phe Cys Leu Asn Leu Ile Lys Thr Leu Lys Leu Pro Asn
                325                 330                 335

Phe Lys Ser Cys Val Ile Leu Leu Gly Leu Leu Leu Leu Tyr Asp Val
            340                 345                 350

Phe Phe Val Phe Ile Thr Pro Phe Ile Thr Lys Asn Gly Glu Ser Ile
        355                 360                 365

Met Val Glu Leu Ala Ala Gly Pro Phe Gly Asn Asn Glu Lys Leu Pro
    370                 375                 380
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Val Val Ile Arg Val Pro Lys Leu Ile Tyr Phe Ser Val Met Ser Val
385                 390                 395                 400

Cys Leu Met Pro Val Ser Ile Leu Gly Phe Gly Asp Ile Ile Val Pro
                405                 410                 415

Gly Leu Leu Ile Ala Tyr Cys Arg Arg Phe Asp Val Gln Thr Gly Ser
            420                 425                 430

Ser Tyr Ile Tyr Tyr Val Ser Ser Thr Val Ala Tyr Ala Ile Gly Met
        435                 440                 445

Ile Leu Thr Phe Val Val Leu Val Leu Met Lys Lys Gly Gln Pro Ala
    450                 455                 460

Leu Leu Tyr Leu Val Pro Cys Thr Leu Ile Thr Ala Ser Val Val Ala
465                 470                 475                 480

Trp Arg Arg Lys Glu Met Lys Lys Phe Trp Lys Gly Asn Ser Tyr Gln
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Met Met Asp His Leu Asp Cys Ala Thr Asn Glu Glu Asn Pro Val Ile
            500                 505                 510

Ser Gly Glu Gln Ile Val Gln Gln
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<212> PRT
<213> Homo sapiens

<400> 19

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Ser Thr Val Ala Gly Gly Lys Tyr Gly Val Ala His Val Val Ser Glu
             20                  25                  30

Asn Trp Ser Lys Asp Tyr Cys Ile Leu Phe Ser Ser Asp Tyr Ile Thr
         35                  40                  45

Leu Pro Arg Asp Leu His His Ala Pro Leu Leu Pro Leu Tyr Asp Gly
     50                  55                  60

Thr Lys Ala Pro Trp Cys Pro Gly Glu Asp Ser Pro His Gln Ala Gln
 65                  70                  75                  80

Leu Arg Ser Pro Ser Gln Arg Pro Leu Arg Gln Thr Thr Ala Met Val
                 85                  90                  95

Met Arg Gly Asn Cys Ser Phe His Thr Lys Gly Trp Leu Ala Gln Gly
            100                 105                 110

Gln Gly Ala His Gly Leu Leu Ile Val Ser Arg Val Ser Asp Gln Gln
        115                 120                 125

Cys Ser Asp Thr Thr Leu Ala Pro Gln Asp Pro Arg Gln Pro Leu Ala
    130                 135                 140

Asp Leu Thr Ile Pro Val Ala Met Leu His Tyr Ala Asp Met Leu Asp
145                 150                 155                 160
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Ile Leu Ser His Thr Arg Gly Glu Ala Val Val Arg Val Ala Met Tyr
165 170 175

Ala Pro Pro Glu Pro Ile Ile Asp Tyr Asn Met Leu Val Ile Phe Ile
180 185 190

Leu Ala Val Gly Thr Val Ala Ala Gly Gly Tyr Trp Ala Gly Leu Thr
195 200 205

Glu Ala Asn Arg Leu Gln Arg Arg Arg Ala Arg Arg Gly Gly Gly Ser
210 215 220

Gly Gly His His Gln Leu Gln Glu Ala Ala Ala Ala Glu Gly Ala Gln
225 230 235 240

Lys Glu Asp Asn Glu Asp Ile Pro Val Asp Phe Thr Pro Ala Met Thr
245 250 255

Gly Val Val Val Thr Leu Ser Cys Ser Leu Met Leu Leu Leu Tyr Phe
260 265 270

Phe Tyr Asp His Phe Val Tyr Val Thr Ile Gly Ile Phe Gly Leu Gly
275 280 285

Ala Gly Ile Gly Leu Tyr Ser Cys Leu Ser Pro Leu Val Cys His Leu
290 295 300

Ser Leu Arg Gln Tyr Gln Arg Pro Pro His Ser Leu Trp Ala Ser Leu
305 310 315 320

Pro Leu Pro Leu Leu Leu Leu Ala Ser Leu Cys Ala Thr Val Ile Ile
325 330 335

Phe Trp Val Ala Tyr Arg Asn Glu Asp Arg Trp Ala Trp Leu Leu Gln
340 345 350

Asp Thr Leu Gly Ile Ser Tyr Cys Leu Phe Val Leu His Arg Val Arg
355 360 365

Leu Pro Thr Leu Lys Asn Cys Ser Ser Phe Leu Leu Ala Leu Leu Ala
370 375 380

Phe Asp Val Phe Phe Val Phe Val Thr Pro Phe Phe Thr Lys Thr Gly
385 390 395 400

Glu Ser Ile Met Ala Gln Val Ala Leu Gly Pro Ala Glu Ser Ser Ser
405 410 415

His Glu Arg Leu Pro Met Val Leu Lys Val Pro Arg Leu Arg Val Ser
420 425 430

Ala Leu Thr Leu Cys Ser Gln Pro Phe Ser Ile Leu Gly Phe Gly Asp
435 440 445

Ile Val Val Pro Gly Phe Leu Val Ala Tyr Cys Cys Arg Phe Asp Val
450 455 460

Gln Val Cys Ser Arg Gln Ile Tyr Phe Val Ala Cys Thr Val Ala Tyr
465 470 475 480

Ala Val Gly Leu Leu Val Thr Phe Met Ala Met Val Leu Met Gln Met
485 490 495

Gly Gln Pro Ala Leu Leu Tyr Leu Val Ser Ser Thr Leu Leu Thr Ser
500 505 510

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Gln Gly Arg Ala Lys Met Cys Gly Leu Gly Cys Ala Pro Ser Ala Gly
    530                 535                 540

Ser Arg Gln Lys Gln Glu Gly Ala Ala Asp Ala His Thr Ala Ser Thr
545                 550                 555                 560

Leu Glu Arg Gly Thr Ser Arg Gly Ala Gly Asp Leu Asp Ser Asn Pro
                565                 570                 575

Gly Glu Asp Thr Thr Glu Ile Val Thr Ile Ser Glu Asn Glu Ala Thr
            580                 585                 590

Asn Pro Glu Asp Arg Ser Asp Ser Ser Glu Gly Trp Ser Asp Ala His
        595                 600                 605

Leu Asp Pro Asn Glu Leu Pro Phe Ile Pro Pro Gly Ala Ser Glu Glu
    610                 615                 620

Leu Met Pro Leu Met Pro Met Ala Met Leu Ile Pro Leu Met Pro Leu
625                 630                 635                 640

Met Pro Pro Pro Ser Glu Leu Gly His Val His Ala Gln Ala Gln Ala
                645                 650                 655

His Glu Thr Gly Leu Pro Trp Ala Gly Leu His Lys Arg Lys Gly Leu
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Lys Val Arg Lys Ser Met Ser Thr Gln Ala Pro Leu
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<212> DNA
<213> Homo sapiens

<400> 20
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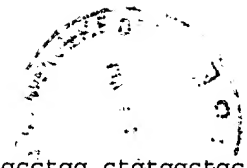

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